

MARIE

June 2003 Status – Science Data Comments

The MARIE instrument is continuing to operate as anticipated.

During June 2003, the MARIE instrument provided radiation data from 1st through the 30th with a few intermittent breaks due to data download and erase sequences. In the month of June, the MARIE instrument was in science mode, acquiring data, about ~ 85% of the time, corresponding to ~ 25 days.

Measurements from MARIE during the period from June 1st through 30th indicate that the background GCR dose-rate was 20 ± 2 mrad/day, within 10% of the model calculations. For the month of June, the model prediction of quiet-time GCR was 22.5 mrad/day while the MARIE measured June month average quiet-time GCR was 20.7 mrad/day. Thus, the MARIE measurements are ~ 8% of the predicted model calculations, however, uncertainties in the MARIE measured data are currently estimated to be $\pm 10\%$ or greater. Towards the end of May (29th and 31st) and early part of June (1st and 2nd) we have MARIE observations of dose-rate enhancements due to SPE. The average dose-rate including SPE during the month of June (GCR+SPE) is ~ 21.8 mrad/day.

The average Earth-Sun-Mars angle during June was about 25.31° with Earth at 1.02 AU and Mars at 1.42 AU.

MARIE Recent Observations: From early November 2002 through mid-March 2003, there were no SPE enhanced dose-rate was observed. This is the longest period without an SPE since the start of the Odyssey mapping phase in March 2002. A particularly interesting SPE was observed on March 18-19, 2003; analysis of that data has been a top priority of the science team. No SPEs were observed in April 2003. May 2003 consists of mostly quiet time GCR and a sharply raising SPE enhanced dose-rate during the 29th and the 31st that extended through June 1st.

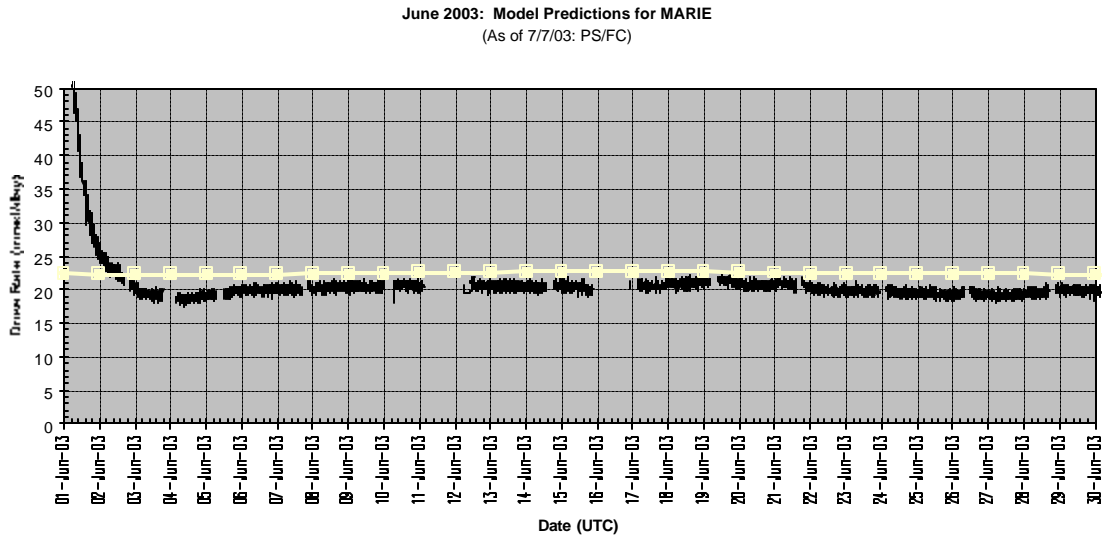


Figure 1: Radiation dose-rate from the GCR contribution in the Martian orbit during June 2003. Dose-rate (mrads/day) measurements from MARIE (black discrete line) are shown along with the model predictions (yellow dotted line). The average dose-rate is within 10% of the model predictions. Also, see Figure 2.

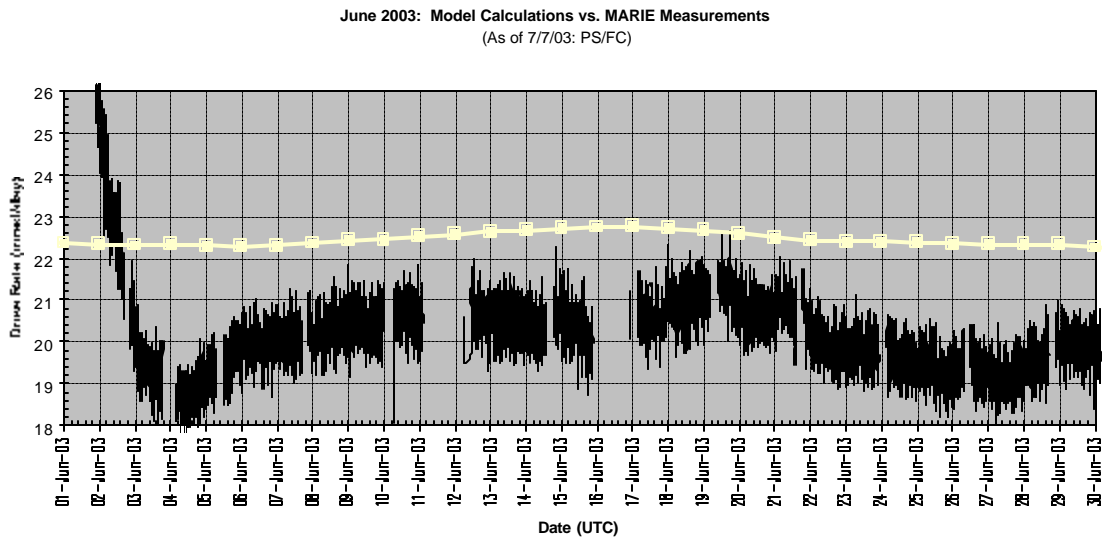


Figure 2 (Close-up view of Figure 1): Radiation dose-rate from the GCR contribution in the Martian orbit during June 2003. Dose-rate (mrads/day) measurements from the MARIE instrument (black discrete line) are shown along with the model predictions (yellow dotted line). Short-term GCR modulation of the MARIE measurements are in concert with the model predicted variations.

June 2003: Model Calculations vs. MARIE Measurements
(As of 7/7/03: PS/FC)

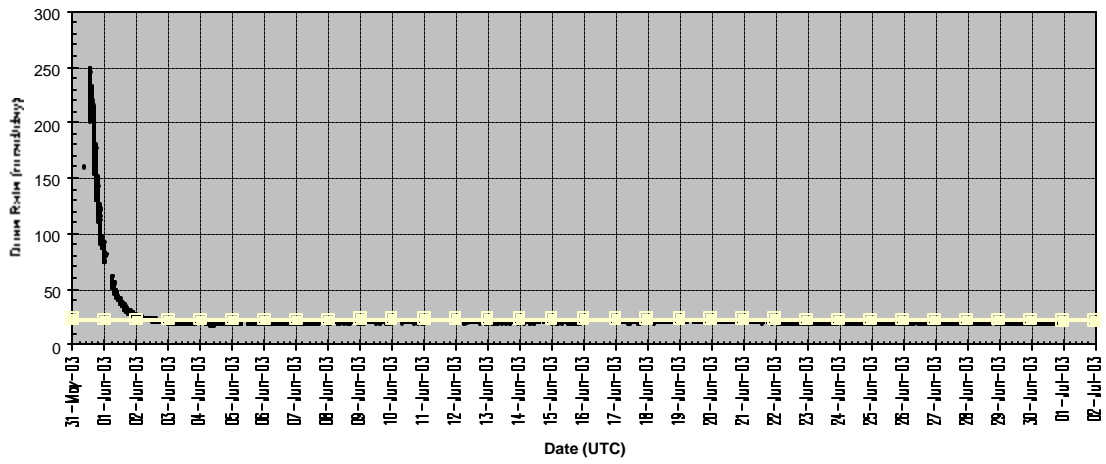


Figure 3 Radiation dose-rate from the background CCR and SPE contribution during later part of May 2003 and early part of June 2003. Dose-rate (mrads/day) measurements from the MARIE instrument (black discrete line) are shown along with the model predictions (yellow dotted line).